

AMENDMENTS TO THE CLAIMS

Please amend the claims as indicated below. The language being added is underlined ("___") and the language being deleted contains a strikethrough ("—").

LISTING OF CLAIMS

1. (Currently Amended) A method for implementing smart ~~DSL~~ for LDSL digital subscriber lines (DSL) to Long reach digital subscriber lines (LDSL) systems, the method comprising:

presenting a number of spectral masks that are available on the LDSL systems;
and

selecting from the number of spectral masks an upstream mask and a downstream mask based on pre-defined optimization criteria such that for a given transmit power, channel capacity is maximized in both upstream and downstream directions while spectral compatibility is maintained between upstream and downstream channels as well as with neighboring services.

2. (Original) The method of claim 1 wherein selecting the upstream mask and the downstream mask is performed during a modem start up period.

3. (Original) The method of claim 1 wherein selecting the upstream mask and the downstream mask is performed manually.

4. (Original) The method of claim 1 wherein selecting the upstream mask and the downstream mask is performed automatically.

5. (Original) The method of claim 1 wherein the number of spectral masks further comprises a number of upstream masks ($U_1, U_2, U_3, \dots, U_n$) and a number of downstream masks ($D_1, D_2, D_3, \dots, D_n$).

6. (Original) The method of claim 5 wherein one of the number of upstream masks is defined by the following relations, wherein f is a frequency band in kHz and U_1 is the value of the mask in dBm/Hz:

for $0 < f \leq 4$, then $U_1 = -97.5$, with max power in the in 0-4 kHz band of +15 dBm;

for $4 < f \leq 25.875$, then $U_1 = -92.5 + 23.43 \times \log_2(f/4)$;

for $25.875 < f \leq 60.375$, then $U_1 = -29.0$;

for $60.375 < f \leq 90.5$, then $U_1 = -34.5 - 95 \times \log_2(f/60.375)$;

for $90.5 < f \leq 1221$, then $U_1 = -90$;

for $1221 < f \leq 1630$, then $U_1 = -99.5$ peak, with max power in the $[f, f+1 \text{ MHz}]$ window of $(-90 - 48 \times \log_2(f/1221) + 60) \text{ dBm}$; and

for $1630 < f \leq 11040$, then $U_1 = -99.5$ peak, with max power in the $[f, f+1 \text{ MHz}]$ window of -50 dBm.

7. (Original) The method of claim 5 wherein one of the number of downstream masks is defined by the following relations, wherein f is a frequency band in kHz and $D1$ is the value of the mask in dBm/Hz:

for $0 < f \leq 4$, then $D1 = -97.5$, with max power in the in 0-4 kHz band of +15 dBm;

for $4 < f \leq 25.875$, then $D1 = -92.5 + 20.79 \times \log_2(f/4)$;

for $25.875 < f \leq 81$, then $D1 = -36.5$;

for $81 < f \leq 92.1$, then $D1 = -36.5 - 70 \times \log_2(f/81)$;

for $92.1 < f \leq 121.4$, then $D1 = -49.5$;

for $121.4 < f \leq 138$, then $D1 = -49.5 + 70 \times \log_2(f/121.4)$;

for $138 < f \leq 353.625$, then $D1 = -36.5 + 0.0139 \times (f - 138)$;

for $353.625 < f \leq 569.25$, then $D1 = -33.5$;

for $569.25 < f \leq 1622.5$, then $D1 = -33.5 - 36 \times \log_2(f/569.25)$;

for $1622.5 < f \leq 3093$, then $D1 = -90$;

for $3093 < f \leq 4545$, then $D1 = -90$ peak, with maximum power in the $[f, f+1$ MHz] window of $(-36.5 - 36 \times \log_2(f/1104) + 60)$ dBm; and

for $4545 < f \leq 11040$, then $D1 = -90$ peak, with maximum power in the $[f, f+1$ MHz] window of -50 dBm.

8. (Original) The method of claim 5 wherein one of the number of upstream masks is defined by the following relations, wherein f is a frequency band in kHz and $U2$ is the value of the mask in dBm/Hz:

for $0 < f \leq 4$, then $U_2 = -97.5$, with max power in the in 0-4 kHz band of +15 dBm;

for $4 < f \leq 25.875$, then $U_2 = -92.5 - 22.5 \times \log_2(f/4)$;

for $25.875 < f \leq 86.25$, then $U_2 = -30.9$;

for $86.25 < f \leq 138.6$, then $U_2 = -34.5 - 95 \times \log_2(f/86.25)$;

for $138.6 < f \leq 1221$, then $U_2 = -99.5$;

for $1221 < f \leq 1630$, then $U_2 = -99.5$ peak, with max power in the $[f, f+1 \text{ MHz}]$ window of $(-90 - 48 \times \log_2(f/1221) + 60)$ dBm; and

for $1630 < f \leq 11040$, then $U_2 = -99.5$ peak, with max power in the $[f, f+1 \text{ MHz}]$ window of -50 dBm.

9. (Original) The method of claim 5 wherein one of the number of downstream masks is defined by the following peak values, wherein f is a frequency in kHz and D_2 is the peak value of the mask in dBm/Hz:

for $f = 0.0$, then $D_2 = -98.0$;

for $f = 3.99$, then $D_2 = -98.00$;

for $f = 4.0$, then $D_2 = -92.5$;

for $f = 80.0$, then $D_2 = -72.5$;

for $f = 120.74$, then $D_2 = -47.50$;

for $f = 120.75$, then $D_2 = -37.80$;

for $f = 138.0$, then $D_2 = -36.8$;

for $f = 276.0$, then $D_2 = -33.5$;

for $f = 677.0625$, then $D_2 = -33.5$;

for $f=956.0$, then $D2=-62.0$;
for $f=1800.0$, then $D2=-62.0$;
for $f=2290.0$, then $D2=-90.0$;
for $f=3093.0$, then $D2=-90.0$;
for $f=4545.0$, then $D2=-110.0$; and
for $f=12000.0$, then $D2=-110.0$.

10. (Original) The method of claim 5 wherein one of the number of upstream masks is defined by the following peak values, wherein f is a frequency in kHz and $U3$ is the peak value of the mask in dBm/Hz:

for $f=0$, then $U3=-101.5$;
for $f=4$, then $U3=-101.5$;
for $f=4$, then $U3=-96$;
for $f=25.875$, then $U3=-36.30$;
for $f=103.5$, then $U3=-36.30$;
for $f=164.1$, then $U3=-99.5$;
for $f=1221$, then $U3=-99.5$;
for $f=1630$, then $U3=-113.5$; and
for $f=12000$, then $U3=-113.5$.

11. (Original) The method of claim 5 wherein one of the number of downstream masks is defined by the following peak values, wherein f is a frequency in kHz and $D3$ is the peak value of the mask in dBm/Hz:

for $f=0$, then $D3=-101.5$;

for $f=4$, then $D3=-101.5$;

for $f=4$, then $D3=-96$;

for $f=80$, then $D3=-76$;

for $f=138$, then $D3=-47.5$;

for $f=138$, then $D3=-40$;

for $f=276$, then $D3=-37$;

for $f=552$, then $D3=-37$;

for $f=956$, then $D3=-65.5$;

for $f=1800$, then $D3=-65.5$;

for $f=2290$, then $D3=-93.5$;

for $f=3093$, then $D3=-93.5$; for $f=4545$, then $D3=-113.5$; and

for $f=12000$, then $D3=-113.5$.